VISUAL RESOURCE MANAGEMENT

VRMS/MOSS-MAPS PILOT STUDY

Cedar City District

Kanab Resource Area

Utah

May 24, 1991

Jerry E. Sempek

ACKNOWLEDGEMENTS

In order to complete this project in a voluntary capacity, I needed plenty of help for its duration. I would like to thank all the folks in the Cedar City District Office for their support, criticism, encouragement, and for generally making me feel at home during my stay. Pete Wilkens agreed to expand his busy workload and acted in a supervisory capacity, introduced me to MOSS/MAPS, and offered suggestions and aid throughout the project. I would like to express my appreciation to Art Tait for both his moral support and for providing subsistence funding. Larry Royer enthusiastically contributed suggestions, offered criticism, and participated in a review capacity. His helpful comments are greatly appreciated. Max Hodson showed a genuine interest in this project, made helpful suggestions, and offered insights about potential relationships with soils mapping work. Janaye Byergo kindly offered to give me a tour of the study site, as well as provide input during the study process. I would also like to thank the Cedar City District Office management staff, Gordon Staker, Ron Montagna, and Paul Swapp for their support and for allowing a "volunteer" to invade their facitities to satisfy his pursuits. Finally, I would like to express my sincere appreciation to Therese Belanger for her love, support, and patience while I indulged myself on a project specific to my interests.

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I. INTRODUCTION

The purpose of this study is to test the feasibility of appling BLM Visual Resources Management (VRM) system inventory and analysis procedures using the Map Overlay and Statistical System and Map Analysis and Processing System (MOSS-MAPS) geographic information system (GIS). The study began in January 1991 and was completed in April 1991. An eight 7.5 minute quad study area east of Kanab, Utah was selected and inventoried following BLM Manual procedures. The data was digitized into the the Utah State GIS with the Automated Digitizing System (ADS) and analyzed using MOSS-MAPS software. A distance zone map was also generated within MOSS, utilized for analysis, and compared with analysis results using the field drawn distance zone map. The resulting graphics were plotted on the Calcomp 1042 plotter and are a part of this report.

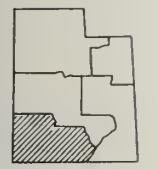
II. THE STUDY AREA

The study area is located approximately 30 miles east of Kanab, Utah and consists of an eight quad area encompassing some 284,000 acres. See Figure 1 - Study Area Location Map. Included within this study were the following quad sheets:

- West Clark Bench
- Bridger Point
- Fivemile Valley
- Lower Coyote Spring
- Calico Peak
- Horse Flat
- Slickrock Bench
- Butler Valley

Figure 1 - Study Area Location Map.

CEDAR CITY DISTRICT 04



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The Paria Canyon-Vermillion Cliffs Wilderness Area, by virtue of its statutory designation, has a VRM Class I objective and consequently is not part of this study. The study area includes the easternmost escarpments of the Vermillion and White Cliffs of the Grand Staircase of southern Utah. Virtually all of the study area is within the viewshed of overlooks located within Bryce Canyon National Park. Other noted scenic features highlighting the landscape within the confines of this study include: The Cockscomb, Grosvenor Arch, The Rushbeds, Blue Cove, Wahweap Canyon, Paria River, various benches, and pinyon-juniper covered hills. Cultural modifications also positively and negatively impact the scenic quality of the area. Powerlines cross the Cockscomb and run adjacent to it, Cottonwood Road parallels the Cockscomb, Paria Movie Set and the Old Paria Townsite are located along the Paria River channel, and line shacks and pioneer cabins are scattered throughout the vicinity. The combination of topographic features and cultural modifications impart a high degree of visual complexity to this particular region, and provide an interesting site upon which to conduct this study.

III. THE STUDY PROCESS

This study consisted of the following five phases:

PHASE	TIME REQUIREMENT
Pre-Inventory	4 weeks
Inventory	3 weeks
Review & Revisions	2 weeks
Data Input	1.5 weeks
Data Analysis and Results	3 weeks
TOTAL TIME REQUIREMENT	13.5 weeks

Each of these phases are described in the following narrative.

A. Pre-Inventory

This phase of the study process consisted of an orientation period to become familiar with the study area and the computer hardware and software. Four weeks of time beginning on January 8 and ending February 5,1991 were devoted to this work phase. Work items completed during this time included:

1. General BLM, VRM, and RMP Orientation - This item consisted of discussions with Cedar City District Office personnel, reviewing "Opportunity and Challenge - The Story of BLM", reviewing portions of BLM Manual 8400 - Visual Resource Management, reviewing BLM Manual 8410 - Visual Resource Inventory and Evaluation, and attending a Resources Management Plan training session in Kanab.

2. Computer and GIS Software Orientation - This item included computer hardware familiarization (the Pericom computer, the Calcomp 1042 Plotter), review of the MOSS-MAPS GIS manual, study sessions applying MOSS-MAPS analysis techniques to sample data, and ADS training.

3. Study Area Orientation - This item included compiling and splicing the eight quad maps into one study area map, plotting major roads, recreation areas, campgrounds, perennial rivers and streams, and other potential observation points for review with the Kanab Area Recreation Planner, and a site visit with the Recreation Planner to review the area and finalize selection of the observation points used in this analysis. See Appendix 1 for the Key Observation Points and Areas Map. The following linear and point-specific observation points were selected:

Cottonwood Road	White House Campground
U.S.Highway 89	Paria River
Pump Springs Campground	Coyote Creek Road
Paria Movie Set/Paria Townsite	Church Wells
Grosvenor Arch Campground	Hackberry Canyon

These observation areas were used to map the Distance Zone Overlay which is part of the following analysis. See the Data Analysis section later in this report for a description of this process.

B. Inventory

This phase of the study consisted of in-house mapping and the field inventory. Three weeks of time were necessary to complete this task. Work items completed during this time period included the following:

1. In-house Mapping - Prior to and during the field inventory, it was necessary to delineate scenic quality rating units (SQRU's) on the 7.5 minute paper quad maps. Orthophoto maps were used to locate landform breaks, especially for areas that could not be visited in the field. SQRU's were generally delineated in the field, but it was found to be more efficient if a preliminary mapping exercise was conducted in the office and then field verified.
2. Field Inventory - Scenic quality and visual distance zones were mapped and evaluated during the field inventory. A total of eight field days (approx. 12 hrs/day = 96 man hours) were spent conducting the field inventory. Drive time from Kanab to the study area averaged approximately 1.5 to 2.5 hours per day. Camping on-site would obviously result in considerable time savings if a large scale

project is undertaken requiring considerable commuting time from the office. In this case, assuming a 2 hour/day average commute, 16 man hours or 16.6% of the total field inventory time was spent commuting from Kanab to the study area. Time savings also resulted by working 12 hour plus days. Had eight hour days been worked and again assuming a 2 hour/day average commuting time, the field inventory could have been expected to take a total of 108 man hours or 112.5% of the time spent on the inventory. In this case, each quad required 12 man hours to field inventory and a total of 16 man hours/quad for the entire inventory phase.

As noted in Section H-8410-1 of the BLM Manual, the size of SQRU's may vary from less than 100 acres to several thousand acres and that "... Normally, more detailed attention will be given to highly scenic areas or areas of known high sensitivity...". The Cockscomb area is known as a highly scenic landscape and both the Cottonwood Road and the Paria Movie Set road are official Utah Scenic Byways, have high visitation rates, and the study area incorporates their viewshed corridors. The Cottonwood Road visitation rate may increase if proposed improvements are constructed. Because of these conditions it was felt that this area should be given a more detailed examination from a visual inventory standpoint. Consequently, a scale of 1:24000 was considered appropriate for this inventory and analysis. It should be noted that this information is compatible for use with future inventories that may be conducted at other scales as long as the same evaluation parameters are adopted.

Based on this work, 1:24000 appears to be an appropriate scale to use for future scenic quality inventories of highly complex scenic landscapes, while 1:100000 may be appropriate for a more generalized inventory or for less complex landscapes. Of the three variables (scenic quality, sensitivity, and distance), scenic quality appears to be most subject to the need for large scale mapping of discrete units of a limited area. Distance zones are a function of topographic elevational complexity linked to key observation point locations. Sensitivity could probably be mapped at 1:100,000 because it is not necessarily a function of landscape complexity. However, it is desirable to maintain consistent polygon perimeters whenever possible to avoid unnecessary complexity in the final map product. Therefore, areas that are inventoried for scenic quality at 1:24000 should also be evaluated for sensitivity at the same scale to allow duplication of coincident lines when digitizing each theme. Consequently, it is possible to conduct visual inventory work at two different scales and to combine the information into one map and thus respond to the need for detailed information as appropriate and to still meet budget and time requirements.

3. Scenic Quality Inventory - A total of 50 SQRU's varing in size from a few hundred acres to several thousand acres were delineated and evaluated during this inventory. The BLM Scenic Quality Rating Summary Sheets are found in Appendix 2. With the exception of seven SQRU's, all were visited, photographed, and evaluated in the field. The seven SQRU's not visited in the field were delineated using orthophoto quads and were evaluated by referencing aerial slides previously shot of the area. BLM Manual 8400 procedures were

followed and a standard Form 8400-1 was completed summarizing the visual characteristics and assigning "A", "B", or "C" scenic quality ratings for each unit. The evaluation forms and photographic documentation is housed in a three ring binder ("VRM MOSS/MAPS PILOT STUDY - Field Documentation) found in the Cedar City District Office. The Scenic Quality Rating Units Map is found in Appendix 4.

4. Visual Distance Zones Inventory - Distance zones indicating foreground-middleground and seldomseen areas were mapped in the field according to BLM manual procedures. Although the manual lists background as a category, the nature of this landscape is such that views are either foreground-middleground or not seen, so background was not mapped for this study. Foreground-middleground distance zones visible for five miles from the previously mentioned observation areas were delineated simultaneously with the scenic quality evaluation. The Visual Distance Zone Map (Alt. 1) is found in Appendix 4.

5. Sensitivity Level Inventory - Eighteen Sensitivity Level Rating Units (SLRU's) were delineated and evaluated in the office, as high, moderate, or low, in consultation with the Kanab Area Recreation Planner and according to manual procedures. The sensitivity level summary sheet is found in Appendix 3. The initial ratings of some of these units were modified during the analysis process in consultation with the Cedar City District Recreation Planner. The Sensitivity Level Rating Units Map is found in Appendix 4.

C. Review & Revisions

Data collected during the inventory phase was reviewed and modified in consultation with the Kanab Area and Cedar City District Recreation Planners. Two weeks (10 man days) were spent in the review and revision process. This review process was also conducted following data input to the Utah State BLM GIS. Refinements, including revising scenic quality ratings for some SQRU's, and spatially dividing and revising the ratings of some SLRU's, were made at this time prior to producing the final Visual Resource Inventory Classes Map.

D. Data Input

All data collected during the Inventory Phase was digitized into the Utah State BLM GIS utilizing the Automated Digitizing System (ADS) software. One and one-half weeks (7 man days) were required to train, digitize, edit, and assign attributes to the inventory data. Two of these days were spent in ADS training sessions. The following themes for the previously mentioned eight quads were digitized:

-Water (Hackberry Creek and the main stem of the Paria River)

-Roads (US Highway 89, Cottonwood Road, Coyote Creek Road, Paria Townsite Road, Grosvenor Arch Road, Paria Canyon Campground Road)

-Scenic Quality Rating Units

-Visual Distance Zones

-Sensitivity Level Rating Units

E. Data Analysis

Following digitization of the themes, the ADS files were converted to MOSS vector maps at the Utah State BLM office. These vector maps were then converted to raster format, assigned cell values, and electronically overlaid to generate the final Visual Resource Inventory Classes Map. Three weeks were spent conducting this analysis phase.

The time spent in this phase reflects ineffiencies due to the learning curve of an inexperienced operator and the fact that the digitized theme maps were not signed off by the recreation planners prior to conversion to MOSS. Thus time was spent revising maps in MOSS rather than ADS where the revisions could have done a bit more quickly. The ADS to MOSS conversion is performed in the State office. It is recognized that a need for quality control exists and that State office conversion of ADS maps is a quality control check. Although the ADS to MOSS conversion was very timely in this case, if turn around time is a factor a potential bottleneck due to scheduling conflicts could occur here. This points out the need to conduct thorough reviews of the ADS maps before they are converted to MOSS. The initial Visual Resources Inventory Classes Map was produced in one day following MOSS conversion of the ADS maps. Even though revisions were required, the system can accomodate them but at the expense of efficiency.

Additional time was spent looking at the feasibility of generating a visual distance map in MOSS. This will be discussed in more detail later in this report.

1. Analysis Process - The thrust of this analysis is to look at the feasibility of automating the VRM manual process and to compare the results of substituting a MOSS generated distance zone map in lieu of the field drawn map. The first step in this process is to merge the digital elevation maps (DEM) into one map. This merged map establishes the "window" to be used for the rest of the analysis. In order to proceed with GIS analysis of the data, a specific sequence of steps was followed to generate the final analysis map. As mentioned above, three themes; Scenic Quality Rating Units,

Sensitivity Level Rating Units, and Visual Distance Zones are required to generate the Visual Resource Inventory Classes Map. The outline shown below illustrates a typical sequence of steps required to process each of the three VRM themes:

1. Conduct field inventory and record spatial information on 7.5 minute paper quads.
2. Digitize data using ADS to create a line or polygon map and assign attributes. (Ideally, the data should be transferred to stabilized mylar sheets prior to digitizing.)
3. Convert the ADS map to a MOSS vector map. See Appendix 4.
4. Review accuracy of attributes for each polygon in the vector maps.
5. Merge the 8 quad DEM map and set the window.
6. Rasterize each vector map to a discrete map with 150 meter X 150 meter cells. See Appendix 5. This cell size is approximately equal to 5.6 acres and was selected because it represents a reasonable cell size to use for analysis and it is compatible with the raster format of DEM data. It should be noted that if any analysis will involve DEM maps the cell sizes of all themes must be the same and the cell sizes must be described in metric units. Therefore, the analysis process should be well thought out prior to rasterizing any maps.
7. Label the cell value for each polygon by subject.
8. After executing the above sequence for each of the themes, add the three themes for a new dichotomous map.

9. Extract the new dichotomous map for a new discrete map, assigning new cell values to old cell values and/or a range of old cell values. (See the section titled "Assignment of Cell Values" for more detail.)

10. This extracted discrete map is the Visual Resources Inventory Classes Map and may be displayed on the terminal in color or shaded, or may be plotted on the Calcomp plotter or on electrostatic plotter in the State BLM office. See Appendix 6.

Figure 2. illustrates a recommended VRM inventory process.

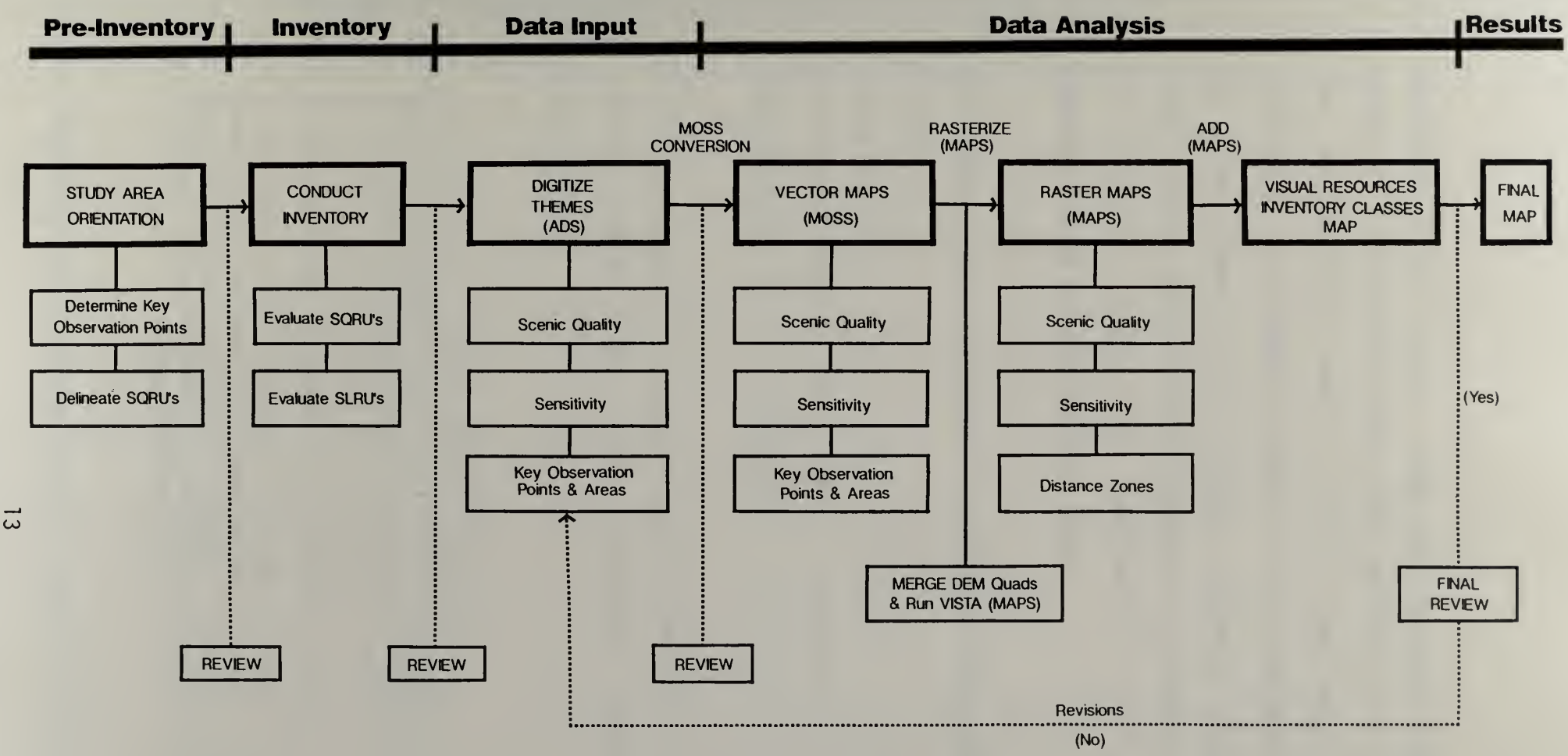


Figure 2. VRM Inventory Process

2. Assignment of Cell Values - Since the conceptual MOSS/MAPS analysis process is basically the same as that outlined in the BLM VRM Manual, i.e. an additive overlay process, the process outlined in Illustration 11 of Section H-8410-1 of the BLM Manual was adopted. Due to the nature of this landscape, the visual distance zones were either in the foreground-middleground or seldomseen. Consequently the background category was considered to equal the seldomseen category for the purposes of this study.

Cell values for each category within the theme were assigned as follows:

Scenic Quality:	A = 6	B = 2	C = 1
Sensitivity Levels	High = 3	Moderate = 2	Low = 1
Distance Zones	Fg/Mg = 2	ss = 1	

The following matrix illustrates the BLM VRM rating system and lists the GIS point totals (in parentheses) required for each classification.

VISUAL SENSITIVITY LEVELS

		High			Moderate			Low
SCENIC	A	II (11)	II (10)	II (10)	II (10)	II (9)	II (9)	II (8)
QUALITY	B	II (7)	III (6)	III (6)	III (6)	IV (5)	IV (5)	IV (4)
	C	III (6)	IV (5)	IV (5)	IV (5)	IV (4)	IV (4)	IV (3)
		f/m	b*	ss	f/m	b	ss	ss

VISUAL DISTANCE ZONES

*Note: Background and seldomseen have been combined in this study.

For example, let's assume a polygon has a scenic quality rating of "A" (6), a moderate sensitivity (2), and is in the foreground-middleground (2). Adding these cell values equals a sum of 10, classifying that polygon as Visual Resource Inventory CLass II. This process was followed to generate the Visual Resources Inventory Map (Alt. 1) found in Appendix 6.

IV. ALTERNATIVE ANALYSIS METHODOLOGY

Since digital elevation maps are available for the Kanab Resource Area, a MOSS-MAPS generated distance zone map, Visual Distance Zone Map (Alt. 2), was also produced (See Appendix 7.). This map was incorporated into the analysis process and compared with analysis results generated using the field drawn distance zone map. The resulting map, Visual Resources Inventory Classes Map (Alt. 2), is found in Appendix 8. Results of this comparison are discussed below.

Although the Denver Service Center speculates there may be some bugs in the Vista command, the resulting map appears to be quite accurate and will be used for illustrative purposes in this report. However, the accuracy of Vista should be confirmed prior to conducting future analysis. In this case, Vista was used to identify visible cells within a distance of five miles of the key observation points. The point specific observation points were combined with the linear observation areas as the visible areas were identified on a cell by cell basis. The MOSS generated distance zone map shows a larger visible area within five miles of the observation points than the field drawn map. Isolated visible areas were also more accurately identified than could be done in the field. The field drawn distance zone map identified 112,726 acres as visible, while the MOSS generated map showed 144,090 acres as visible. These

differences in visible areas affect each alternative of the Visual Resources Inventory Classes Map. A comparison of acreages for each category in Alternative 1 and Alternative 2 is listed below:

	ALTERNATIVE 1 (w/o Vista command)	ALTERNATIVE 2 (w/ Vista command)
Class II	125,342 acres	127,610 acres
Class III	40,203 acres	46,269 acres
Class IV	118,681 acres	110,347 acres

As shown above, when the computer generated distance zone map is used in the analysis, the acreages in Alternative 2 for Classes II and III are increased, while the acreage in Class IV are decreased. Because of the increased accuracy of Visual Distance Zone Map (Alt. 2), the Visual Resources Inventory Classes Map (Alt. 2) will reflect a coresponding increase in accuracy. Consequently, the use of the Vista command in MAPS to generate the distance zone theme for the VRM inventory saves digitizing time while producing a more accurate map.

V. CONCLUSIONS AND RECOMMENDATIONS

The results of this study suggest that the use of GIS and specifically MOSS-MAPS, is a feasible and desirable method of conducting VRM analysis. The use of MOSS-MAPS analysis produces documented products that are easily stored and retrieved for later review or presentation. Questions have been raised concerning whether there are significant time savings over the traditional system. I have no doubt that if the VRM process is applied as described in the BLM Manual time economies are gained. However, I believe the real value is in the use of a process that is adaptable to change and can easily respond to the availability of new information. The technology is conducive to cycling and recyling information during analysis allowing work to be reviewed and refined as new input is received.

For example, several sets of key observation points can be selected and Visual Distance Zone Maps quickly and easily produced to correspond with each set. Another opportunity presented by MOSS-MAPS analysis is the ability to quickly analyze any reassignments of cell values and weights in the VRM rating system matrix. Sensitivity is the most dynamic component of the inventory system. The MOSS-MAPS technology allows for immediate adjustments of sensitivity to accommodate changes in landscape viewing and use patterns. Thus even though a "final" product is created, the process and technology are responsive to change, and able to quickly and easily incorporate new data into analysis, show its effects, and hopefully promote informed management decisions.

Recommendations:

1. Map Scale for VRM Inventory - 1:24000 is appropriate to allow the input of accurate spatial information for a detailed visual inventory, especially an inventory of very complex landscapes. The use of this scale should be seriously considered, especially if areas

of potential controversy are identified.

2. Visual Distance Zone Map - Although the accuracy remains to be confirmed, when working properly the use of the MAPS Vista command will produce a more accurate and meaningful map which can be incorporated into the analysis process to generate a the Visual Resource Inventory Classes Map. Time requirements for digitizing will also be reduced.

3. Scenic Quality Rating Units - With the advent of computer technology and the emphasis on best use of financial and personnel resources, the process of delineating SQRU's should be revisited. A cursory review suggests there may be a direct relationship between SQRU boundaries and soils mapping units. More study should be directed in this area. If a relationship exists and the soils mapping has been completed, considerable time could be saved by referencing soils maps when delineating the SQRU's prior to conducting the field inventory. Coincident lines from the soils maps could also be duplicated to the scenic quality theme, creating vector maps for MOSS-MAPS analysis that would directly relate to previous work and may be more valuable for future analysis or reference.

4. Polygon Coincidence Between Themes - When possible polygons boundaries of the various themes should be constructed to be coincident creating a final map with simplified polygons. This allows RMP decisionmakers to assign visual resource management class objectives to landscape units which are more easily administered and more clearly understood by the public than a map with very complex and irregular polygons.

Key Observation Points and Areas Map

Appendix 1

KEY OBSERVATION POINTS & AREAS – KANAB RES. AREA, UTAH

BLM Scenic Quality Rating Summary Sheets

Appendix 2

Form 8400-5
(May 1984)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date April 20, 1991

District
Cedar City, UT

Resource Area
Kanab -VRM Pilot Study

SCENIC QUALITY RATING SUMMARY

1. Evaluators *(names)*

J.E. Sempek

SCENIC QUALITY RATING UNITS (1)	Landform (2)	Vegetation (3)	Water (4)	Color (5)	Adjacent Scenery (6)	Scarcity (7)	Cultural Modification (8)	Total Score (9)	Scenic Quality Rating (10)	EXPLANATION (11)
001	2	2	0	3	5	1	0	13	B	Sage flat with good background views
002	3	2	0	2	5	2	0	14	B	Pinyon-juniper hills
003	4	3	0	4	5	3	0	19	A	Chocolate brown cliffs adjacent to Vermillion cliffs
004	5	3	0	5	4	4	0	21	A	Vermillion cliffs
005	5	3	4	4	3	5	1	25	A	Paria River north of "The Box"
006	5	3	0	5	3	5	-2	19	A	Southern extent of Cockscomb
007	3	1	0	3	4	1	0	12	B	Pinyon-juniper slopes
008	3	3	0	3	3	2	-2	12	B	Pinyon-juniper hills with powerline
009	2	3	0	3	4	1	-2	11	C	Sagebrush flat with powerline adjacent to Cockscomb
010	3	3	0	4	3	3	-2	14	B	Hills with sweeping bands of color
011	1	3	0	1	3	1	0	9	C	West Clark Bench
012	2	2	0	2	4	1	0	11	C	Sage flat bisected by U.S. 89
013	5	1	0	5	4	4	0	19	A	The Rimrocks
014	4	3	4	4	5	4	0	24	A	Paria River near U.S. 89
015	5	3	4	4	0	4	0	20	A	Paria River north of wilderness area
016	3	1	0	3	3	1	0	11	C	UDOT gravel mine and adjacent hills
017	3	3	0	4	4	3	-2	15	B	P-J covered broken topo
018	2	1	0	2	3	1	-1	8	C	Flat Top - south of U.S. 89
019	3	3	0	3	3	1	0	13	B	P-J covered hills
020	1	1	0	2	4	1	0	9	C	Grass and sage covered flat

INSTRUCTIONS

Form is used in conjunction with the Scenic Quality Inventory and Evaluation Chart.

Form 8400-5
(May 1984)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY RATING SUMMARY

Date: April 20, 1991

District: Cedar City, UT

Resource Area: Kanab - VRM Pilot Study

1. Evaluators *(names)*

J.E. Sempek

SCENIC QUALITY RATING UNITS (1)	Landform (2)	Vegetation (3)	Water (4)	Color (5)	Adjacent Scenery (6)	Scarcity (7)	Cultural Modification (8)	Total Score (9)	Scenic Quality Rating (10	EXPLANATION (11)
021	5	2	0	4	4	4	0	19	A	Chimney Rock area badlands
022	1	1	0	3	4	3	-1	11	C	Bunch grass covered plains
023	5	2	0	4	4	4	0	19	A	Blue Cove cliffs
023a	5	1	0	3	4	3	0	16	B	Monochromatic brown cliffs
024	5	3	4	4	4	4	-3	21	A	Paria River south of "The Box"
025	5	3	2	4	5	5	-4	20	A	The Rushbeds
026	5	3	0	4	5	5	-3	19	A	The Cockscomb with powerlines
027	2	3	0	2	3	1	0	11	C	Brigham Plains and Jack Riggs Bench
028	4	3	0	3	3	4	0	17	B	Cad's Crotch
029	5	1	0	3	3	3	0	15	B	Monochromatic cliffs
030	3	3	0	3	4	3	-1	15	B	P-J hill, rock outcroppings and powerlines
031	4	3	0	4	4	4	0	19	A	Grosvenor Arch
032	1	1	0	1	3	1	-1	6	C	Flat topo with powerline
033	3	1	0	2	1	1	0	8	C	P-J covered hills with powerlines
034	1	3	0	2	3	1	-2	8	C	Horse Flat
035	5	3	3	3	2	3	0	19	A	Wahweap Canyon
036	3	3	3	3	3	3	0	18	B	Wahweap Creek
037	3	3	0	2	3	3	0	14	B	Rolling P-J covered topo
037a	5	3	0	4	3	4	0	19	A	Blue Wash
038	2	2	0	2	3	1	0	10	C	Bench topo

INSTRUCTIONS

Form is used in conjunction with the Scenic Quality Inventory and Evaluation Chart.

Form 8400-5
(May 1984)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Date April 20, 1991

District Cedar City, UT

Resource Area Kanab - VRM Pilot Study

SCENIC QUALITY RATING SUMMARY

1. Evaluators *(names)*

J.E. Sempek

SCENIC QUALITY RATING UNITS (1)	Landform (2)	Vegetation (3)	Water (4)	Color (5)	Adjacent Scenery (6)	Scarcity (7)	Cultural Modification (8)	Total Score (9)	Scenic Quality Rating (10)	EXPLANATION (11)
039	3	3	0	3	2	3	0	14	B	P-J covered hills
040	4	1	0	3	3	3	0	14	B	Reddish brown to pink cliffs
041	3	2	0	3	2	2	0	12	B	Reddish brown escarpment
042	5	3	1	3	4	3	0	19	A	Coyote Canyon
043	5	3	4	3	0	4	0	19	A	Mouth of Hackberry Canyon
044	5	4	4	4	0	4	0	21	A	Lower Hackberry Canyon
045	5	4	3	4	0	4	0	20	A	Upper Hackberry Canyon
046	4	3	0	4	4	4	0	19	A	Upper Death Valley
047	4	3	0	4	4	3	0	18	B	Lower Death Valley
048	4	3	1	5	3	4	0	20	A	Hogeye Creek and Snake Creek Area
049	4	2	0	3	4	3	0	16	B	Rock Springs Bench escarpment
050	1	3	0	1	4	1	0	10	C	Bench topo

INSTRUCTIONS

Form is used in conjunction with the Scenic Quality Inventory and Evaluation Chart.

BLM Sensitivity Level Summary Sheet

Appendix 3

Form 8400-6
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SENSITIVITY LEVEL RATING SHEET

Date: April 20, 1991

District: Cedar City, UT

Resource Area: Kanab - VRM Pilot Study

1. Evaluators (*names*)

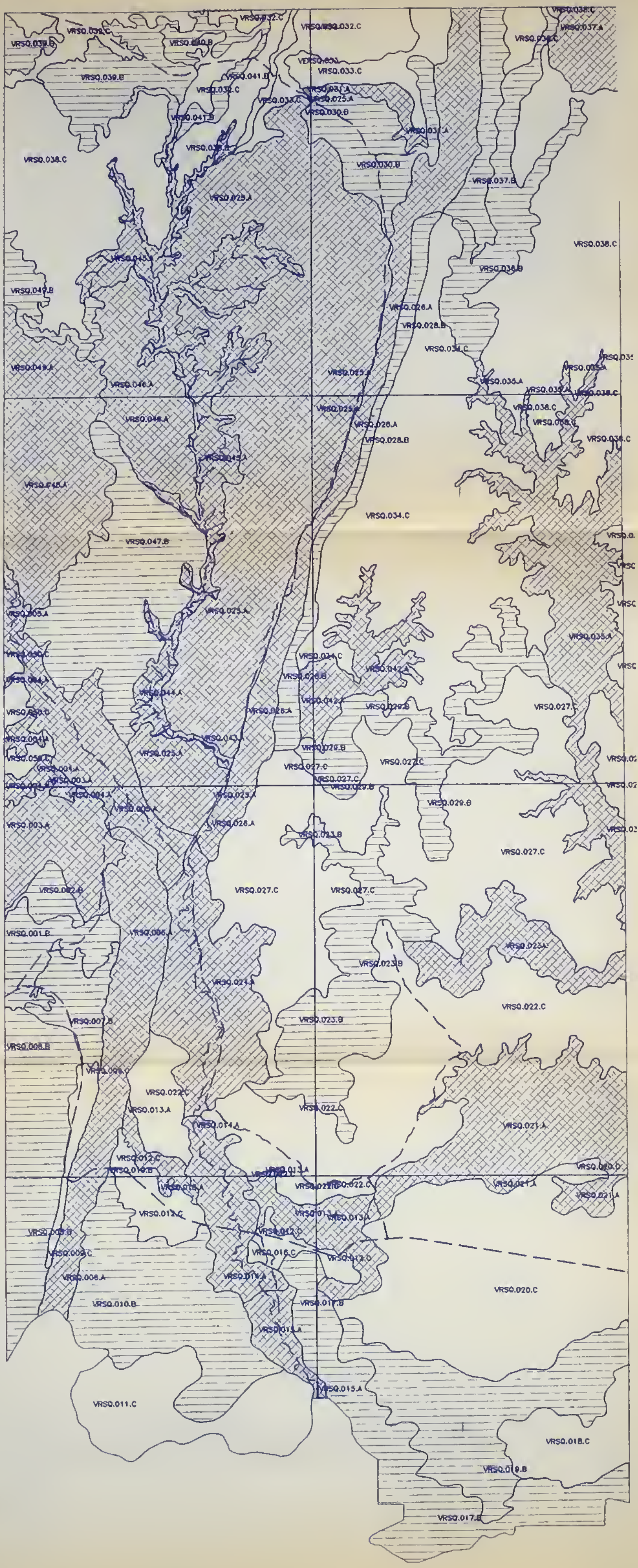
J.E. Sempek, Janaye Byergo, Larry Royer

SENSITIVITY LEVEL RATING UNIT (1)	Type of User (2)	Amount of Use (3)	Public Interest (4)	Adjacent Land Uses (5)	Special Areas (6)	Other Factors (7)	Overall Rating (8)	EXPLANATION (9)
001	M	M	H	H	M		M	East Clark Bench
002	M	M	H	H	M		M	West Clark Bench
003	H	M	H	H	H		H	Paria River
004	H	H	H	M	H		H	Paria River
005	H	H	H	M	H		H	U.S.89 view
006	H	H	H	H	L		H	U.S. 89 view
007	M	L	L	M	L		L	Plains
007a	H	H	H	H	M		H	Brown cliffs
008	H	M	H	M	M		M	Brown cliffs and plains
009	L	L	L	H	L		L	P-J covered hills
010	L	L	L	H	L		L	P-J covered hills
011	H	M	H	H	M		H	Cottonwood Road
012	H	L	H	H	H		H	Hackberry Canyon
013	M	L	M	H	M		M	The Rushbeds
014	M	L	M	H	M		M	Bench
014a	H	M	M	H	H		H	Rock Springs Bench
015	L	L	L	H	L		L	Bench
016	H	M	H	H	M		H	Brown cliffs visible from U.S. 89
017	M	L	M	M	H		M	Wahweap Creek
018	M	L	M	M	M		M	Upper Cockscomb

(Instructions on reverse)

MOSS Vector Maps

Appendix 4



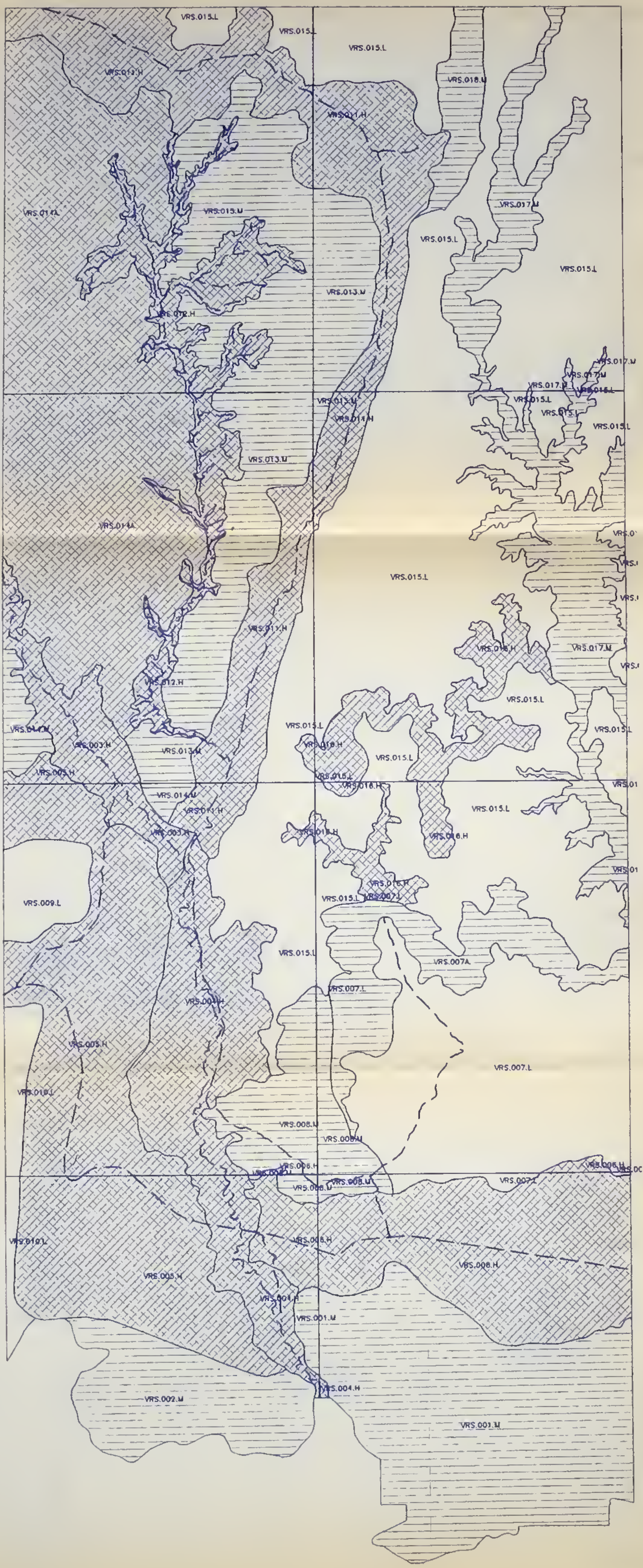
SCALE 1: 100000

N

4.2 0 MILE 4.2

4.2 0 4.2 KILOMETER

SCENIC QUALITY RATING UNITS – KANAB RESOURCE AREA, UTAH



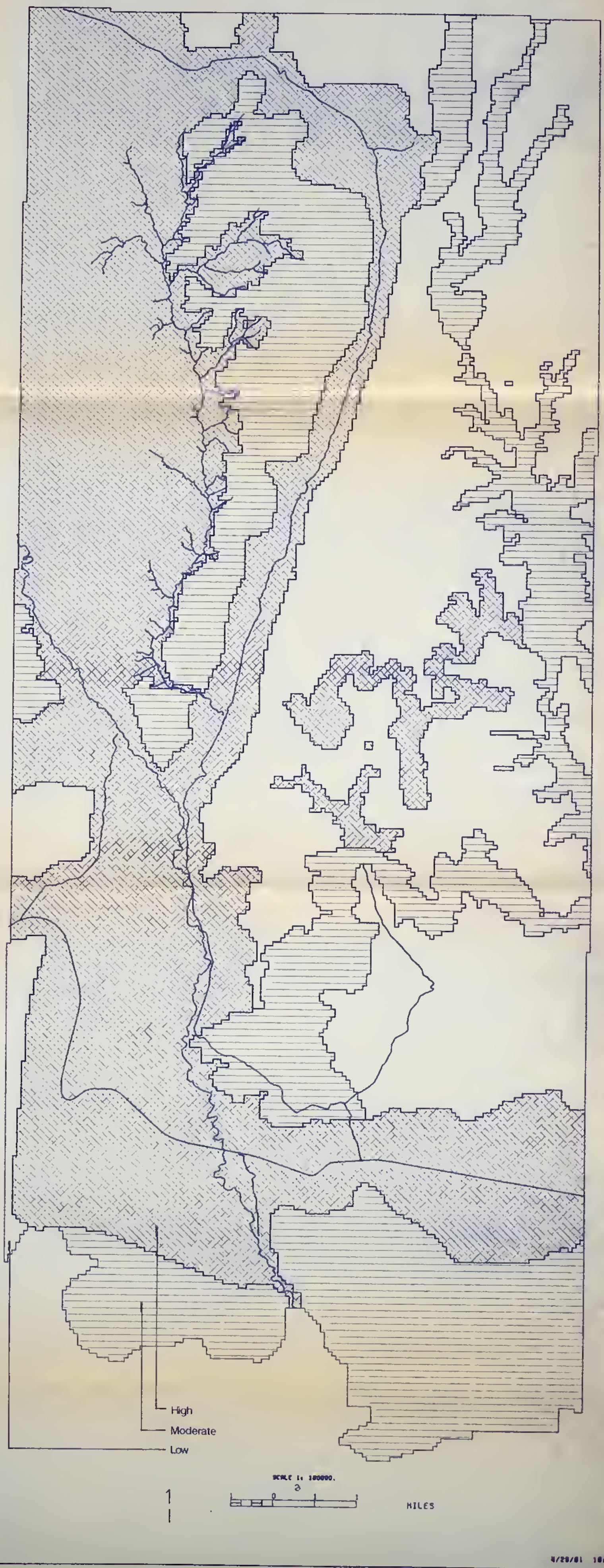
SENSITIVITY LEVEL RATING UNITS – KANAB RES. AREA, UTAH

MOSS Raster Maps

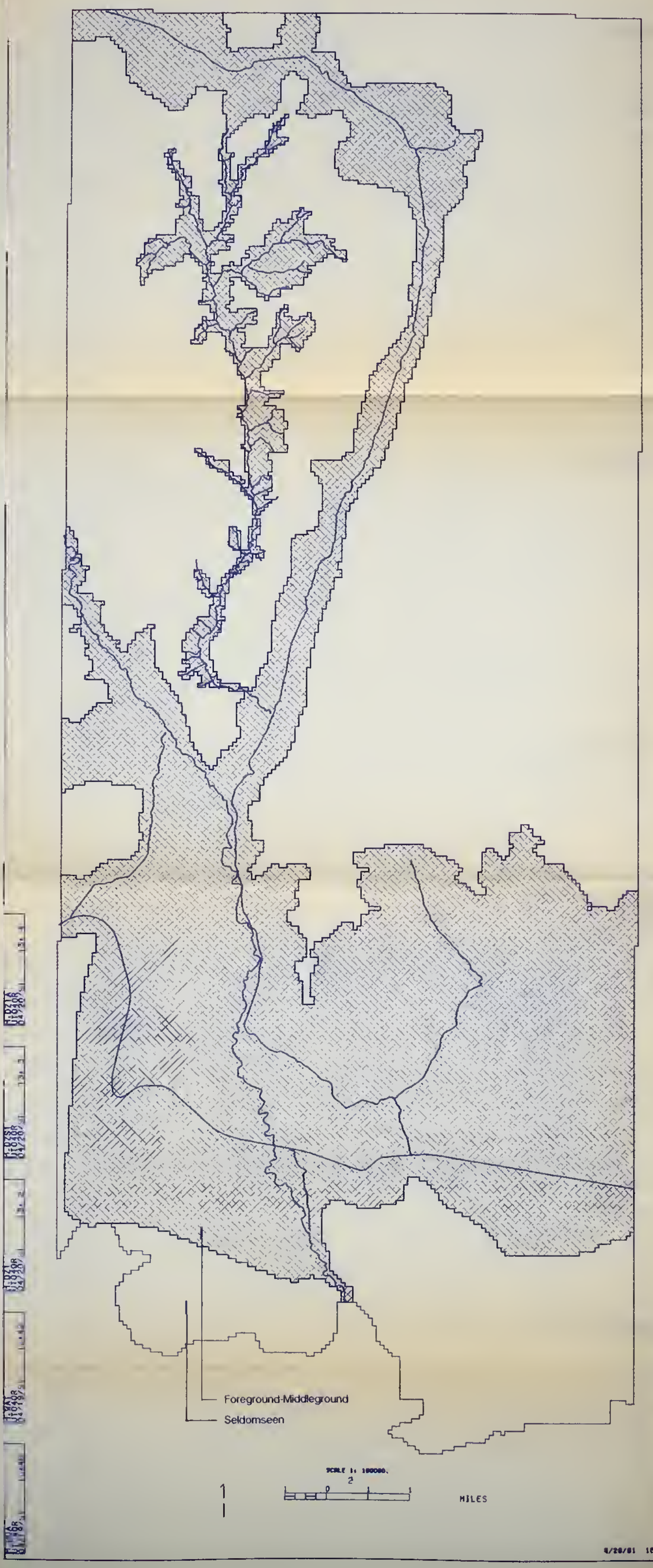
Appendix 5

SCENIC QUALITY RATING UNITS – RASTER MAP

SENSITIVITY LEVEL RATING UNITS - RASTER MAP



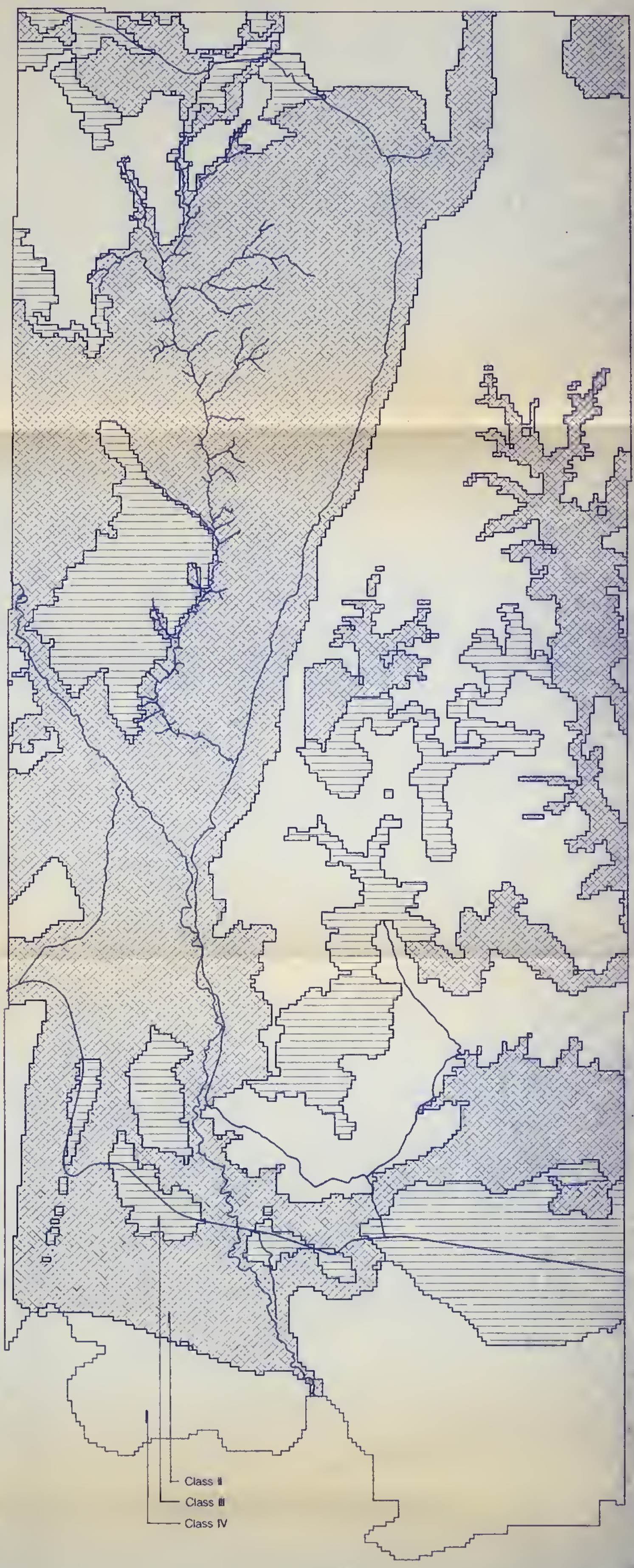
VISUAL DISTANCE ZONE MAP (ALT. 1)



Visual Resources Inventory Classes Map (Alt. 1)

Appendix 6

VISUAL RESOURCES INVENTORY CLASSES MAP (ALT. 1)



Visual Distance Zone Map (Alt. 2)

Appendix 7

VISUAL DISTANCE ZONE MAP (ALT. 2)

Visual Resources Inventory Classes Map (Alt. 2)

Appendix 8

VISUAL RESOURCES INVENTORY CLASSES MAP (ALT. 2)